

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A structural element comprising:
a grating base member formed solely by a plurality of main bearing bars and without distribution or tertiary bars, said main bearing bars spaced to define interstices therebetween, said main bearing bars having an upper portion and a bottom portion;
a top component fixed to said grating base member, said top component being in compression in the direction normal to the main bearing bars, said top component having a planar top surface and a planar bottom surface, said planar bottom surface of said top component being substantially above the bottom portion of said main bearing bar so that said top component does not fill the interstices of said grating base member; and
at least one compression-inducing element within said top component for creating said compression;
said upper portions of said plurality of main bearing bars defining a shear transfer element, and said shear transfer element embedded within said top component.
2. (Original) The structural element as recited in claim 1, wherein said top component compression is provided by prestressing.
3. (Original) The structural element as recited in claim 1 wherein said top component compression is provided by post-tensioning.
4. (Currently Amended) A structural element comprising:
a grating base member formed solely by a plurality of main bearing bars and without distribution or tertiary bars, said main bearing bars spaced to define interstices therebetween, said main bearing bars having an upper portion and a bottom portion;
a top component fixed to said grating base member, said top component in compression ~~under service loads~~ in the direction normal to the main bearing bars, said top component having a planar top surface and a planar bottom surface, said planar bottom

surface of said top component being substantially above the bottom portion of said main bearing bar so that said top component does not fill the interstices of said grating base member;

said upper portions of said plurality of main bearing bars defining a shear transfer element, and said shear transfer element embedded within said top component;

wherein said top component compression is provided by prestressing; and

wherein prestressing strands are placed within the top component transverse to the main bearing bars.

5. (Currently Amended) A structural element comprising:

a grating base member formed solely by a plurality of main bearing bars and without distribution or tertiary bars, said main bearing bars spaced to define interstices therebetween, said main bearing bars having an upper portion and a bottom portion;

a top component fixed to said grating base member, said top component in compression ~~under service loads~~ in the direction normal to the main bearing bars, said top component having a planar top surface and a planar bottom surface, said planar bottom surface of said top component being substantially above the bottom portion of said main bearing bar so that said top component does not fill the interstices of said grating base member;

said upper portions of said plurality of main bearing bars defining a shear transfer element, and said shear transfer element embedded within said top component;

wherein said top component compression is provided by post-tensioning; and

wherein post-tensioning tendons are placed within the top component transverse to the main bearing bars.

6. (Original) The structural element as recited in claim 4, wherein the upper portion of one or more of said main bearing bars comprise a plurality of spaced holes formed in said main bearing bar for providing an enhanced connection between the grating component and the top component.

7. (Original) The structural element as recited in claim 4, wherein the upper portion of one or more of said main bearing bars comprise a plurality of spaced “C” shaped recesses formed in said main bearing bar for providing an enhanced connection between the grating component and the top component.

8. (Original) The structural element as recited in claim 4, wherein the upper portion of one or more of said main bearing bars comprise a plurality of spaced “U” shaped recesses formed in said main bearing bar for providing an enhanced connection between the grating component and the top component.

9. (Original) The structural element as recited in claim 7, wherein at least one of said prestressing strands is positioned within at least one of said recesses formed in said main bearing bars.

10. (Original) The structural element as recited in claim 8, wherein at least one of said prestressing strands is positioned within at least one of said recesses formed in said main bearing bars.

11. (Original) The structural element as recited in claim 5, wherein the upper portion of one or more of said main bearing bars comprise a plurality of spaced holes formed in said main bearing bar for providing an enhanced connection between the grating component and the top component.

12. (Original) The structural element as recited in claim 5, wherein the upper portion of one or more of said main bearing bars comprise a plurality of spaced “C” shaped recesses formed in said main bearing bar for providing an enhanced connection between the grating component and the top component.

13. (Original) The structural element as recited in claim 5, wherein the upper portion of one or more of said main bearing bars comprise a plurality of spaced “U” shaped recesses formed in said main bearing bar for providing an enhanced connection between the grating component and the top component.

14. (Original) The structural element as recited in claim 12, wherein at least one of said post-tensioning tendons is positioned within at least one of said recesses formed in said main bearing bars.

15. (Original) The structural element as recited in claim 13, wherein at least one of said post-tensioning tendons is positioned within at least one of said recesses formed in said main bearing bars.

16. (Original) The structural element as recited in claim 9, wherein said top component includes reinforcing bars.

17. (Original) The structural element as recited in claim 14, wherein said top component includes reinforcing bars.

18. (Original) A structural element comprising:
a grating base member formed solely by a plurality of main bearing bars and without distribution or tertiary bars, said main bearing bars spaced to define interstices therebetween, said main bearing bars having an upper portion and a bottom portion;

a top component fixed to said grating base member, said top component in compression under service loads in the direction normal to the main bearing bars, said top component having a planar top surface and a planar bottom surface, said planar bottom surface of said top component being substantially above the bottom portion of said main bearing bar so that said top component does not fill the interstices of said grating base member;

said upper portions of said plurality of main bearing bars defining a shear transfer element, said shear transfer element embedded within said top component;

compression-inducing elements within said top component for creating said compression within said top component, said compression-inducing elements placed within the top component so as to induce compression in a direction normal to the main bearing bars.

19. (Original) The structural element as recited in claim 18, wherein said compression-inducing elements are placed within the top component transverse to the main bearing bars.

20. (Currently Amended) A method of making a structural element comprising the steps of:

forming a grating base member from a plurality of main bearing members without distribution or tertiary bars;

spacing said main bearing bars to define interstices therebetween,

connecting a top component to said grating base member so that said top component does not fill the interstices of said grating base member,

said step of connecting the top component to the grating base member further comprising the step of embedding upper portions of the main bearing bars within the top component for transferring shear and for preventing vertical separation between the top component and said grating base member; and

creating compression with compression-inducing elements within said top component in the direction normal to the main bearing bars whereby said compression is maintained under service loads.

21. (Original) The method of claim 20 wherein the step of creating compression comprises prestressing the top component.

22. (Original) The method of claim 20 wherein the step of creating compression comprises post-tensioning the top component.

23. (Original) The method of claim 22 wherein the step of post-tensioning further comprises the steps of:

casting hollow tubes into the top component near the neutral axis location;

inserting high strength rods through the ducts; and

creating a tensile force within the rods to place the rods under tension.